CALIFORNIA DEPARTMENT OF HEALTH SERVICES
2151 Berkeley Way, Room 118, Berkeley, CA 94704

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring and Control Program

BIOTOXIN QUARTERLY REPORT

October - December 2001

BIOTOXIN SUMMARY

The enclosed reports (No. 01-28 through 01-33) provide a summary of biotoxin activity and toxigenic phytoplankton distribution for the months of October through December 2001.

October – The distribution of *Alexandrium* in October was similar to September's observations, ranging from Humboldt Bay to offshore of Los Angeles. Overall the numbers of Alexandrium decreased, although there were exceptions to this pattern in northern San Luis Obispo and inside Tomales Bay. Associated PSP toxicity was detected in shellfish along the coast, with concentrations in mussels exceeding the alert level at sampling locations in Sonoma, Marin, and Santa Cruz counties. The samples and observations of our volunteers indicated that *Pseudo-nitzschia* numbers remained high, particularly in northern San Luis Obispo and Monterey sites. The increased sampling resulting from these observations allowed us to detect continued low levels of domoic acid inside Morro Bay. The Department's Food and Drug Branch (FDB) continued sampling crab and sardines along the coast. Elevated levels of domoic acid were detected in crab viscera (offshore of Santa Barbara) and sardines (Monterey Bay).

November – *Alexandrium* numbers decreased in distribution and relative abundance in November, although low numbers were still observed between Humboldt and Monterey counties. PSP toxicity in mussels was detected at numerous sites along the California coast, from Santa Cruz to Del Norte County. *Pseudo-nitzschia* also decreased noticeably by November, although the range of this diatom still extended from Humboldt to Los Angeles counties. FDB continued to sample crab and sardine in November. Low levels were detected in crab viscera from samples collected along the coast of Sonoma and Marin counties. Elevated levels of domoic acid continued to be detected in sardines inside Monterey Bay.

December – *Alexandrium* continued to decrease in number and distribution through December, although higher numbers were observed at sites in southern San Luis Obispo County. PSP toxins were only detected in Humboldt Bay and Point St. George (Del Norte County). *Pseudo-nitzschia* was absent from most coastal sites with the exception of northern San Luis Obispo County.

How to Contact Us:

The Biotoxin Quarterly Report is prepared and distributed by the California Department of Health Services' Marine Biotoxin Monitoring and Control Program.

For information on our program please call (510) 540-3423, fax us at (510) 540-2716, or send an email to glangloi@ix.netcom.com.

Call our toll-free number for recorded information on shellfish quarantines related to marine biotoxins: (800) 553-4133.

QUARANTINES

A Health Advisory was issued on October 5, 2001, warning the public to avoid consumption of sport-harvested sardines due to elevated levels of domoic acid.

On October 22 an additional Health Advisory was issued that warned consumers not to eat any species of sports-harvested bivalve shellfish or the internal organs of sardines, anchovies or crab from the Santa Barbara coast due to possible domoic acid contamination.

The annual quarantine on sport-harvested mussels ended as scheduled on October 31. This annual quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries.

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Table 1. California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during October 2001.

COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	7
	Humboldt County Environmental Health Department	4
Mendocino	None Submitted	
Sonoma	Sonoma County Public Health Department	2
	California Department of Parks and Recreation	1
Marin	Cove Mussel Company	3
	CDHS Marine Biotoxin Program	2
	Hog Island Oyster Company	5
	Johnson Oyster Company	26
	Marin Oyster Company	7
	Point Reyes Oyster Company	2
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	Santa Cruz County Environmental Health Department	2
	U.C. Santa Cruz	6
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	8
	San Luis Obispo County Health Department	1
Santa Barbara	U.C. Santa Barbara Marine Science Institute	5
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department	1
Orange	Orange County Health Care Agency	1
	Ecomar, Inc.	4
San Diego	Carlsbad Aquafarms, Inc.	4
	CDHS Volunteer (Paul Sims)	2

Table 2. Agencies and organizations participating in marine phytoplankton sample collection in California during October 2001.

COUNTY	AGENCY	SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	5
	Arcata High School	3
Mendocino	CDHS Volunteer (Amy Johnson, Jim Wesley)	5
Sonoma	Bodega Marine Lab	1
Marin	CDHS Volunteer (Brent Anderson, Cal Strobel, Linda Judah)	12
	CDHS Marine Biotoxin Program	1
	Johnson Oyster Company	20
	California Department of Fish and Game	2
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugenia McNaughton)	6
	Oceanic Society	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	Santa Cruz County Environmental Health Department	6
Monterey	CDHS Volunteer (Whit and Judy Whitmire)	2
	Pacific Cetacean Group	1
San Luis Obispo	CDHS Volunteer (Judy and Whit Whitmire, Renee and Auburn Atkins, Connie Marangi)	18
	Morro Bay National Estuary Program	1
Santa Barbara	U.C. Santa Barbara Marine Sciences	5
	California Department of Parks and Recreation	3
	Santa Barbara City College	4
Ventura	None Submitted	
Los Angeles	Los Angeles County Sanitation District	3
	Los Angeles County Health Department	2
	Catalina Island Marine Institute	2
Orange	Orange County Sanitation District.	1
San Diego	CDHS Volunteers (Randy and Bill Dick)	1
	San Diego County Environmental Health Department	3

Table 3. California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during November 2001.

COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	5
	Humboldt County Environmental Health Department	3
Mendocino	None Submitted	
Sonoma	Sonoma County Public Health Department	1
	California Department of Parks and Recreation	1
Marin	Cove Mussel Company	1
	CDHS Marine Biotoxin Program	1
	Hog Island Oyster Company	2
	Johnson Oyster Company	16
	Marin Oyster Company	2
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	Santa Cruz County Environmental Health Department	7
	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	8
Santa Barbara	U.C. Santa Barbara Marine Science Institute	7
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department	1
Orange	Ecomar, Inc.	4
San Diego	Carlsbad Aquafarms, Inc.	4
	CDHS Volunteer (Paul Sims)	2

Table 4. Agencies and organizations participating in marine phytoplankton sample collection in California during November 2001.

COUNTY	AGENCY	SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	4
	Arcata High School	4
Mendocino	CDHS Volunteer (Amy Johnson)	1
Sonoma	Bodega Marine Laboratory	1
Marin	CDHS Volunteer (Brent Anderson, Cal Strobel)	4
	CDHS Marine Biotoxin Program	1
	Johnson Oyster Company	16
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugenia McNaughton)	2
San Mateo	None Submitted	
Santa Cruz	San Lorenzo Valley High School High School	2
	Santa Cruz County Environmental Health Department	3
Monterey	CDHS Volunteer (Whit and Judy Whitmire)	1
San Luis Obispo	CDHS Volunteer (Whit and Judy Whitmire, Renee and Auburn Atkins)	9
	Tenera Environmental	1
Santa Barbara	U.C. Santa Barbara Marine Sciences	4
	California Department of Parks and Recreation	1
	Santa Barbara City College	4
Ventura	None Submitted	
Los Angeles	Los Angeles County Sanitation District	3
	Los Angeles County Health Department	4
Orange	Ecomar, Inc.	4
San Diego	San Diego County Environmental Health Department	4

Table 5. California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during December 2001.

COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	4
	Humboldt County Environmental Health Department	4
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	CDHS Marine Biotoxin Program	1
	Hog Island Oyster Company	1
	Johnson Oyster Company	16
	Marin Oyster Company	3
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	8
Santa Barbara	U.C. Santa Barbara Marine Science Institute	4
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department	1
Orange	Orange County Health Care Agency	1
	Ecomar, Inc.	3
San Diego	Carlsbad Aquafarms, Inc.	4
	CDHS Volunteer (Paul Sims)	2

Table 6. Agencies and organizations participating in marine phytoplankton sample collection in California during December 2001.

COUNTY	AGENCY	SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	4
	Arcata High School	4
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	CDHS Volunteer (Brent Anderson, Linda Judah)	3
	Hog Island Oyster Company	1
	Johnson Oyster Company	16
	Cove Mussel Company	1
	Marin Oyster Company	1
	Point Reyes Oyster Company	2
	Tomales Bay Oyster Company	1
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugenia McNaughton)	2
San Mateo	None Submitted	
Santa Cruz	Santa Cruz County Environmental Health Department	4
	San Lorenzo Valley High School	1
	Aptos High School	1
Monterey	None Submitted	
San Luis Obispo	CDHS Volunteer (Whit and Judy Whitmire)	7
	Tenera Environmental	3
Santa Barbara	California Department of Parks and Recreation	2
	U.C. Santa Barbara Marine Sciences	4
	Santa Barbara City College	1
Ventura	California Department of Parks and Recreation	1
Los Angeles	Los Angeles County Sanitation District	3
	Los Angeles County Health Department	2
Orange	Orange County Sanitation District	1
	Ecomar, Inc.	1
San Diego	CDHS Volunteer (Randy and Bill Dick)	1
	San Diego County Environmental Health Department	4

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ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring and Control Program

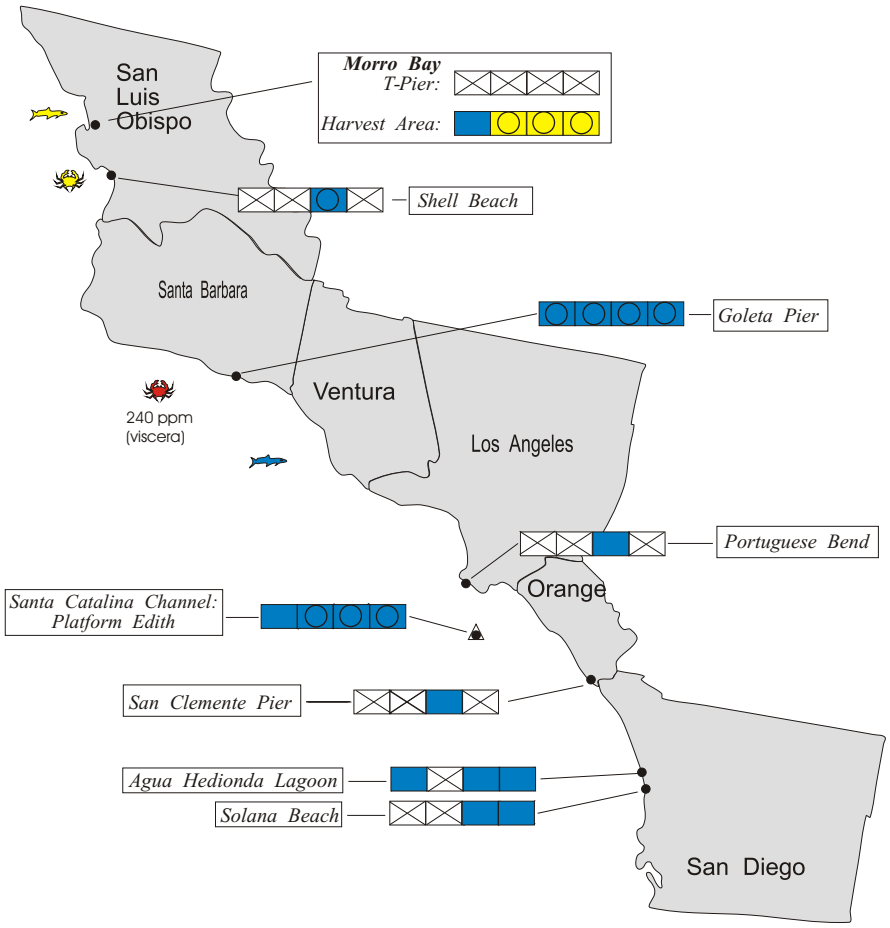
SHELLFISH BIOTOXIN MONTHLY REPORT

October 2001

Technical Report No. 01-28

Distribution of Shellfish Biotoxins

Southern California



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: (ug/100 g) — no sample; not detected; < 80[1]; ≥80

DA Range: (ppm) — no sample; not detected; < 20[2]; ≥ 20

[1]PSP Alert Level [2]DA Alert Level
● = Single Site ◉ = Multiple Sites ▲ = Offshore Site

Source: DHS Marine Biotoxin Monitoring and Control Program, October 2001.

INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

Southern California Summary:

Paralytic Shellfish Poisoning (PSP): The low concentrations of PSP toxins detected in shellfish samples from Morro Bay (San Luis Obispo County) in September continued through the end of October.

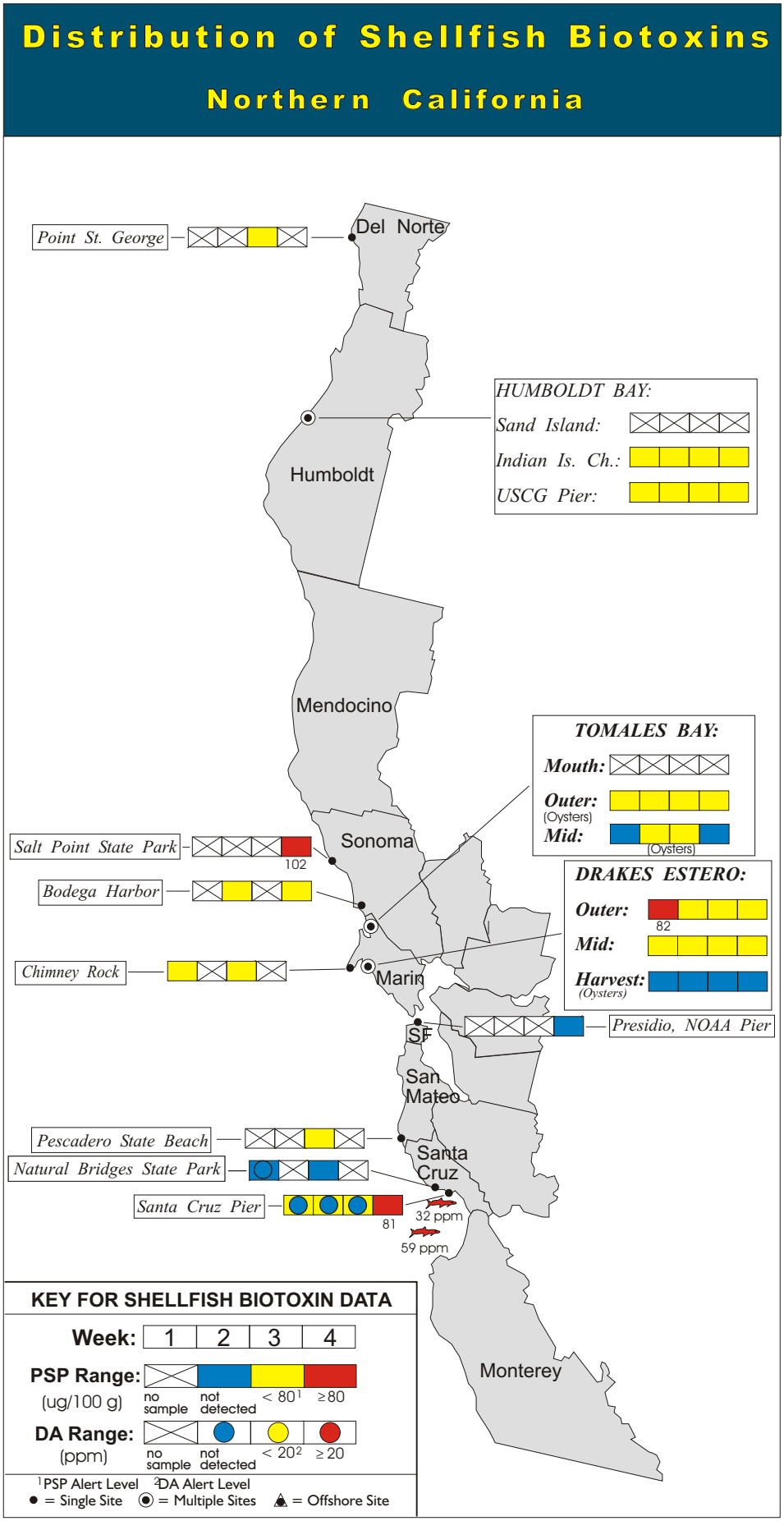
Domoic Acid (DA):

Domoic acid continued to be present in shellfish samples from Morro Bay during October. The highest concentration of DA in mussels and oysters from inside Morro Bay was 3.2 ppm and 4.2 ppm, respectively.

The Department's Food and Drug Branch conducted extensive sampling of sardines, anchovies, and crab from commercial fisheries. Elevated concentrations of DA were detected in the viscera of crabs caught offshore of Santa Barbara. Lower levels of DA were found in sardines and rock crabs caught offshore of San Luis Obispo.

For Information on our Volunteer Field Sampling Program Please Call:

(510) 540-3423



Northern California Summary:

Paralytic Shellfish Poisoning (PSP):

PSP toxin levels decreased in comparison to September's observations but persisted at low levels along the entire northern California coast. Elevated concentrations of PSP toxins were detected at sites along the coast of Sonoma and Santa Cruz counties. The highest detected toxin concentration was in mussels from Salt Point State Park (102 ug/100 g).

Domoic Acid (DA):

The ongoing bloom of *Pseudo-nitzschia* was cause for continued domoic acid monitoring in the Monterey Bay region. Shellfish samples from Santa Cruz did not contain detectable levels of domoic acid despite the observed elevated abundance of this diatom throughout this region.

The Department's Food and Drug Branch sampled commercially caught sardines used for bait and detected DA above the alert level in several samples. The highest concentration of DA detected was 51 ppm. Many other sardine samples contained low or nondetectable concentrations of this toxin throughout the month.

The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.

For More Information Please Call:
(510) 540 - 3423

For Recorded Biotoxin Information Call:
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2151 Berkeley Way, Berkeley CA 94704-1011

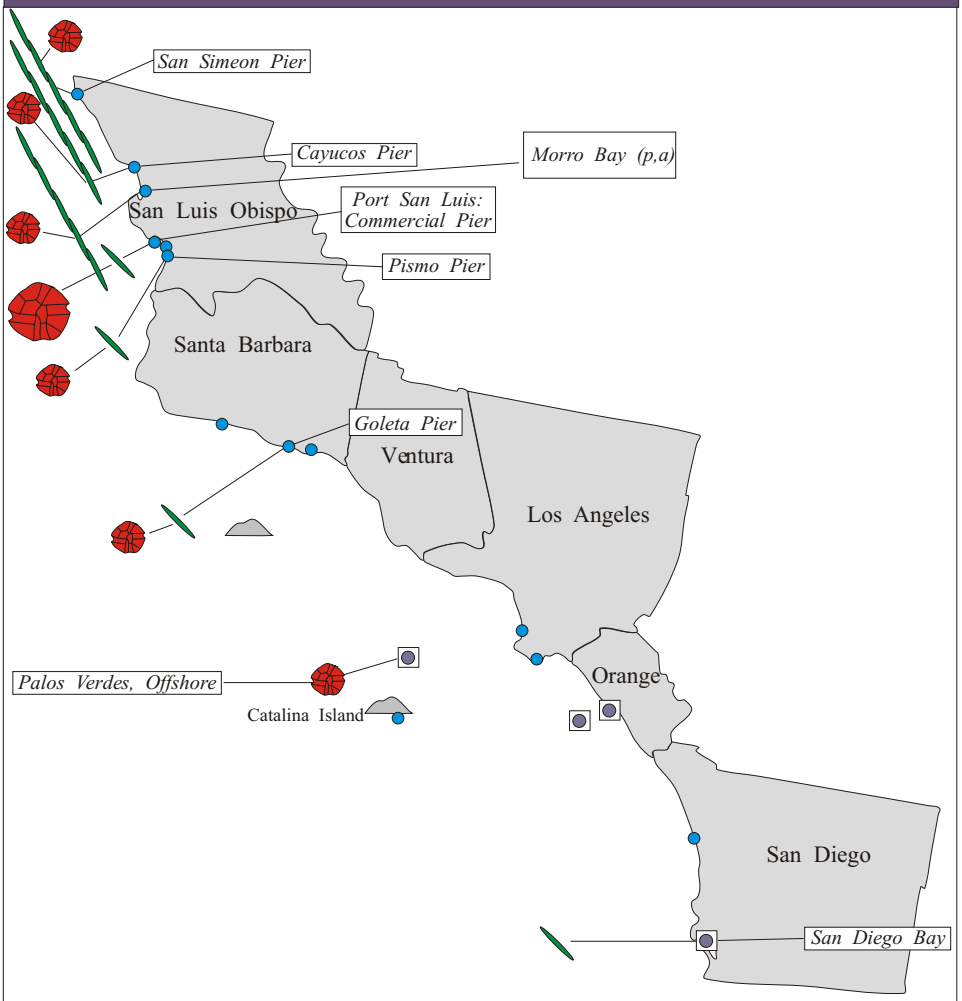
ENVIRONMENTAL MANAGEMENT BRANCH
Phytoplankton Monitoring Program

Phytoplankton Monthly Report

October 2001

Technical Report No. 01-29

Distribution of Toxin-Producing Phytoplankton
Southern California



Relative Abundance of Known Toxin Producers

Alexandrium Species

- Rare (less than 1%)
- Present (between 1% and 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

Pseudo-nitzschia Species

- Present (less than 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Southern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* decreased in relative abundance along the San Luis Obispo coast in October compared to September's observations. Cell densities were also lower in October.

Alexandrium was also present at Goleta Pier (Santa Barbara County) and offshore of the Palos Verdes peninsula (Los Angeles County), although cell numbers were low.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). *Pseudo-nitzschia* numbers remained high along the San Luis Obispo coast but decreased in relative abundance inside Morro Bay and farther south at Pismo Pier. This diatom was very rare or absent in samples collected farther south (Santa Barbara to San Diego counties).

The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.

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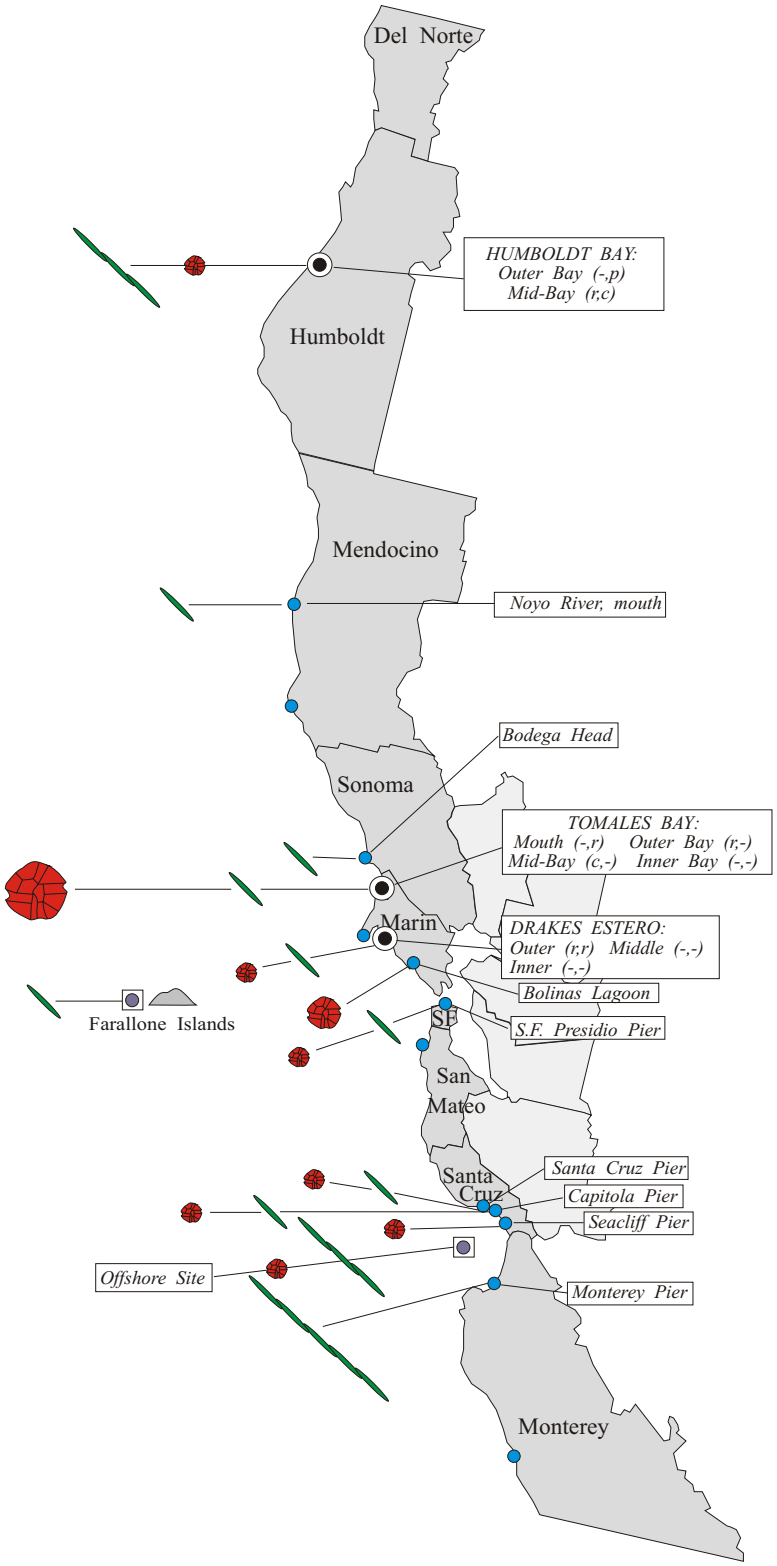
Distribution of Toxin-Producing Phytoplankton Northern California



Northern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* decreased in relative abundance and distribution in October compared to September's observations. This dinoflagellate was observed at several sites along the northern California coast between Santa Cruz and Marin counties, as well as inside Humboldt Bay. The highest relative abundances were observed inside Tomales Bay (Marin County).

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). *Pseudo-nitzschia* numbers remained high at the Monterey pier but declined at most other sampling locations.

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ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring and Control Program

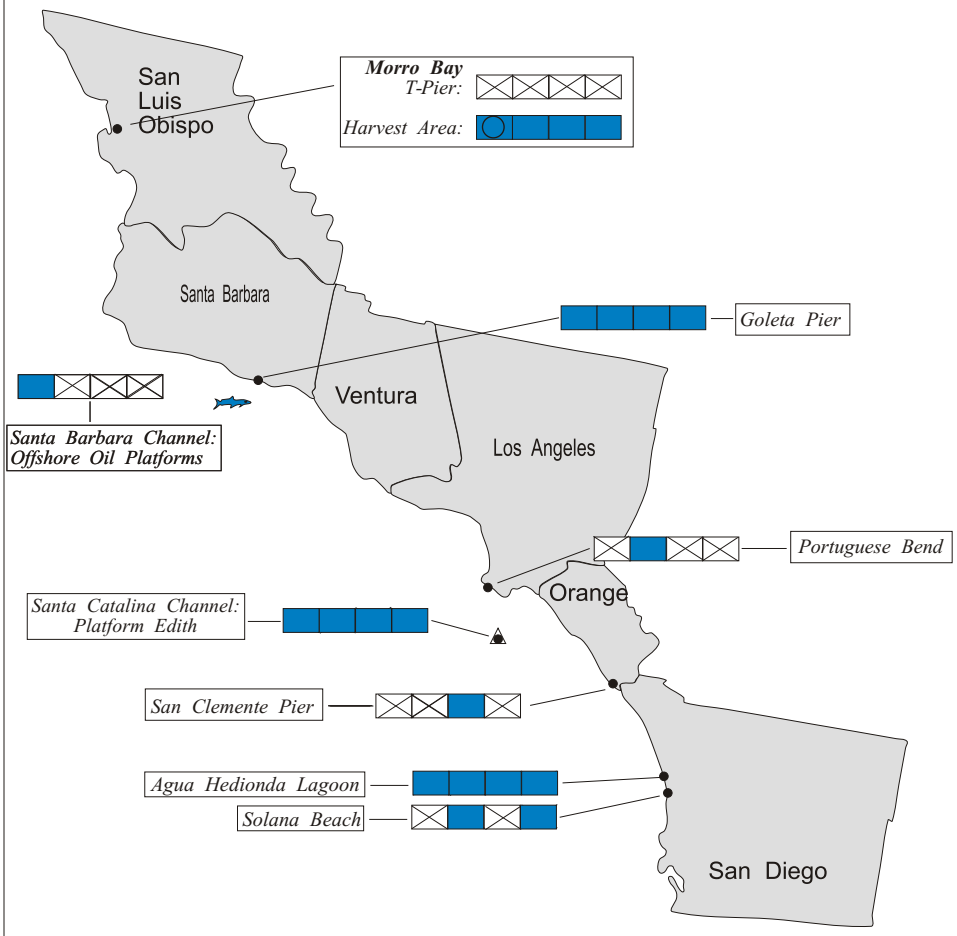
SHELLFISH BIOTOXIN MONTHLY REPORT

November 2001

Technical Report No. 01-30

Distribution of Shellfish Biotoxins

Southern California



KEY FOR SHELLFISH BIOTOXIN DATA

	Week: 1	2	3	4
PSP Range: (ug/100 g)	no sample	not detected	< 80[1]	≥ 80
DA Range: (ppm)	no sample	not detected	< 20[2]	≥ 20

[1] PSP Alert Level [2] DA Alert Level
● = Single Site ◉ = Multiple Sites ▲ = Offshore Site

Source: DHS Marine Biotoxin Monitoring and Control Program, November 2001.

INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

Southern California Summary:

Paralytic Shellfish Poisoning (PSP): The low concentrations of PSP toxins detected in shellfish samples from Morro Bay (San Luis Obispo County) in October decreased below detectable levels by November.

Domoic Acid (DA):

Domoic acid was absent in samples of shellfish from Morro Bay and sardines from Santa Barbara.

For Information on our Volunteer Field Sampling Program Please Call:

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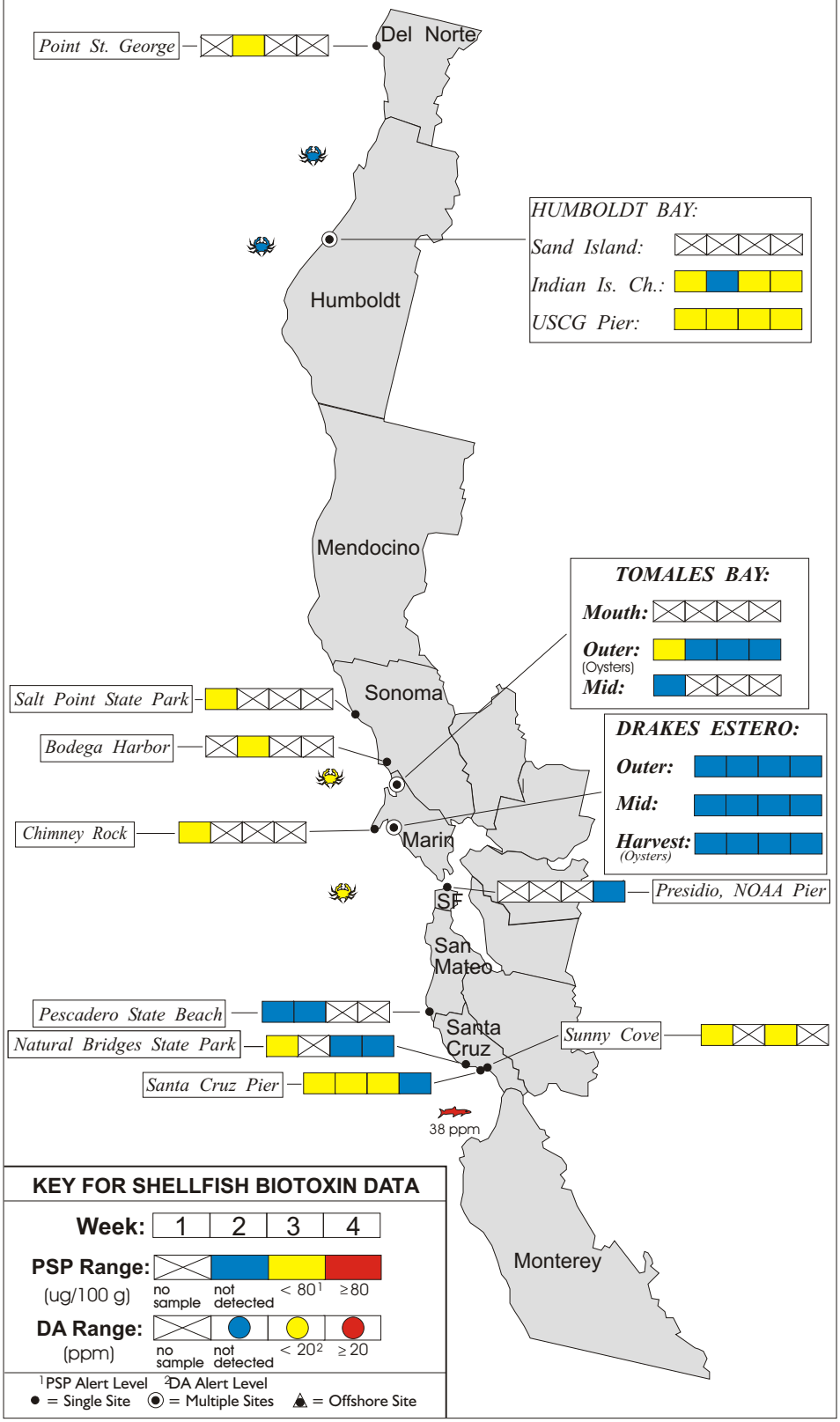
Distribution of Shellfish Biotoxins

Northern California



Northern California Summary:

Paralytic Shellfish Poisoning (PSP):

PSP toxin levels persisted at low levels along the entire northern California coast throughout November.

Domoic Acid (DA):

The Department's Food and Drug Branch sampled commercially caught sardines used for bait and detected DA above the alert level in several samples. The highest detected concentration of domoic acid was 51 ppm. Many other sardine samples contained low or nondetectable concentrations of this toxin throughout the month.

The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.

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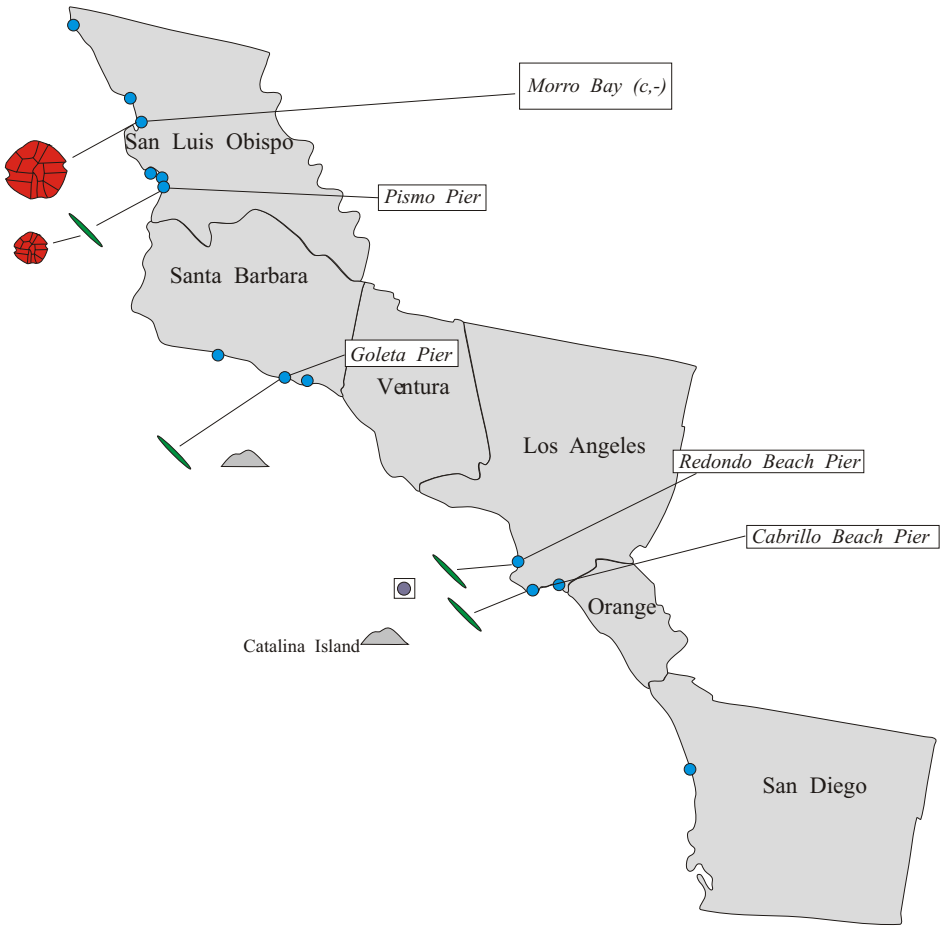
ENVIRONMENTAL MANAGEMENT BRANCH
Phytoplankton Monitoring Program

Phytoplankton Monthly Report

November 2001

Technical Report No. 01-31

Distribution of Toxin-Producing Phytoplankton
Southern California



Relative Abundance of Known Toxin Producers

Alexandrium Species

- Rare (less than 1%)
- Present (between 1% and 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

Pseudo-nitzschia Species

- Present (less than 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Southern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* decreased significantly in relative abundance along the San Luis Obispo coast in November compared to October's observations. This dinoflagellate was not observed at sampling stations along any other southern California county in November.

Although common inside Morro Bay towards the end of November, the overall number of *Alexandrium* cells observed was low.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). *Pseudo-nitzschia* numbers decreased dramatically along the San Luis Obispo coast by the beginning of November. This diatom was very rare or absent in samples collected farther south (Santa Barbara to San Diego counties).

The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.

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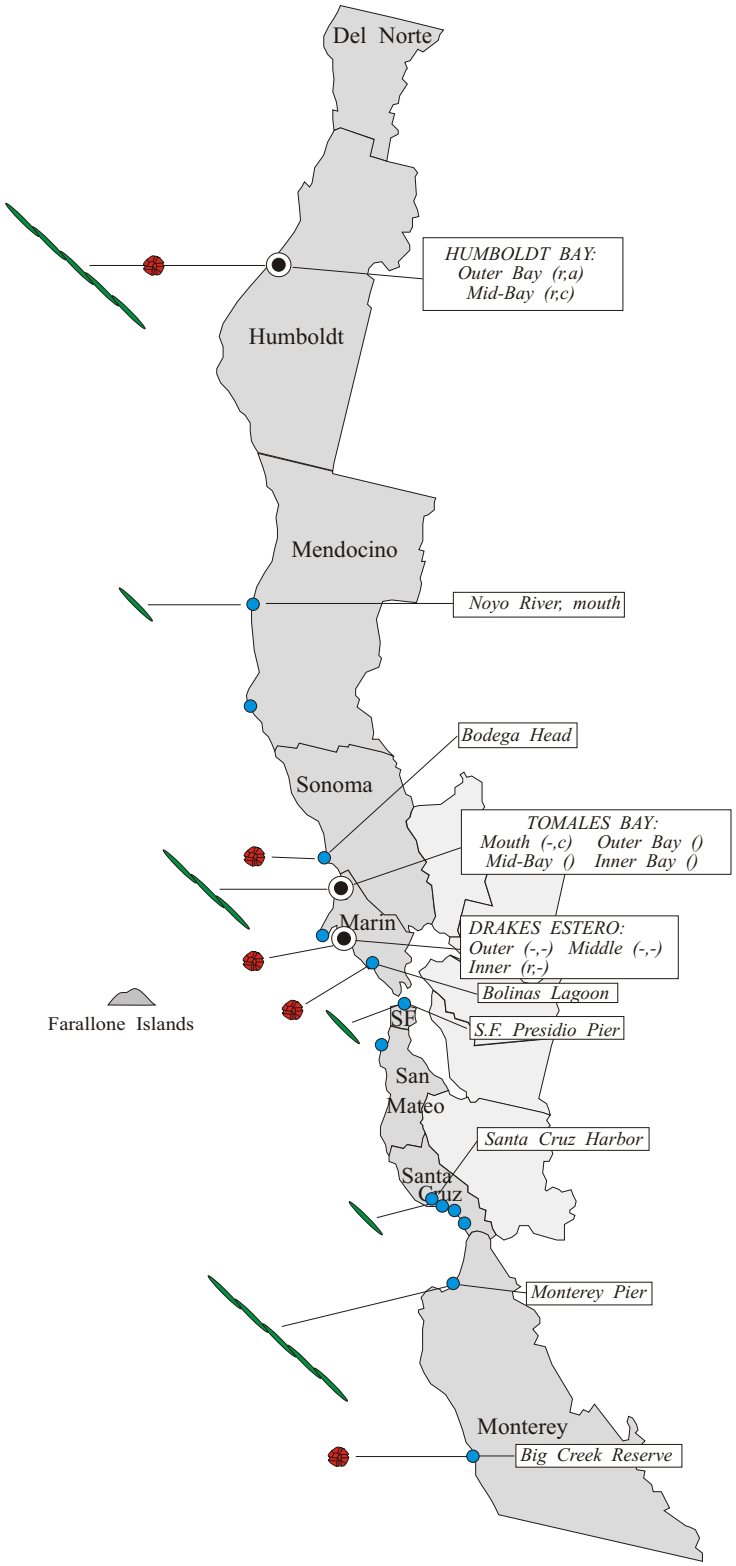
Distribution of Toxin-Producing Phytoplankton Northern California



Northern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* decreased in relative abundance and distribution in November compared to October's observations. This dinoflagellate was observed in low numbers at several sites along the northern California coast. The persistent low numbers of *Alexandrium* inside Humboldt Bay continued to be associated with low levels of PSP toxins in mussels from this area.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). *Pseudo-nitzschia* numbers remained high at the Monterey pier but declined at most other sampling locations. Although abundant in outer Humbold Bay, the overall cell numbers were low and not of immediate concern.

The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.

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ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring and Control Program

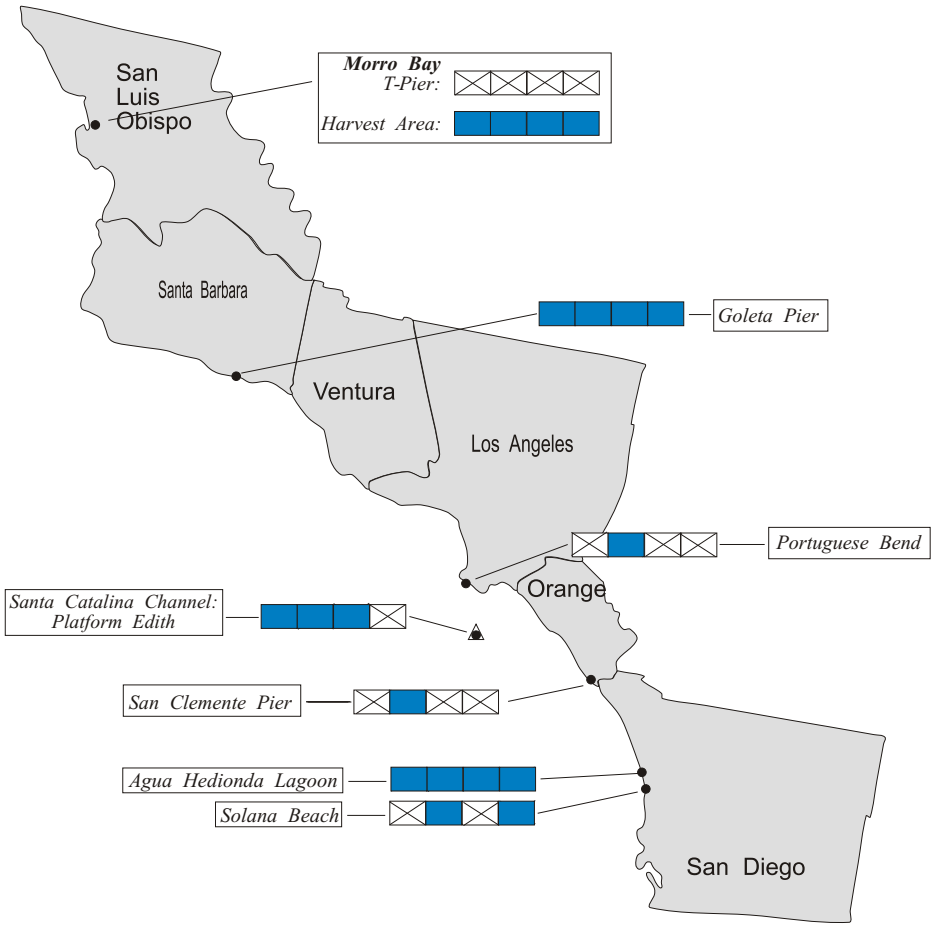
SHELLFISH BIOTOXIN MONTHLY REPORT

December 2001

Technical Report No. 01-32

Distribution of Shellfish Biotoxins

Southern California



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: (ug/100 g) — no sample; not detected; < 80[1]; ≥ 80

DA Range: (ppm) — no sample; not detected; < 20[2]; ≥ 20

[1]PSP Alert Level [2]DA Alert Level
● = Single Site ◉ = Multiple Sites ▲ = Offshore Site

Source: DHS Marine Biotoxin Monitoring and Control Program, December 2001.

INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

Southern California Summary:

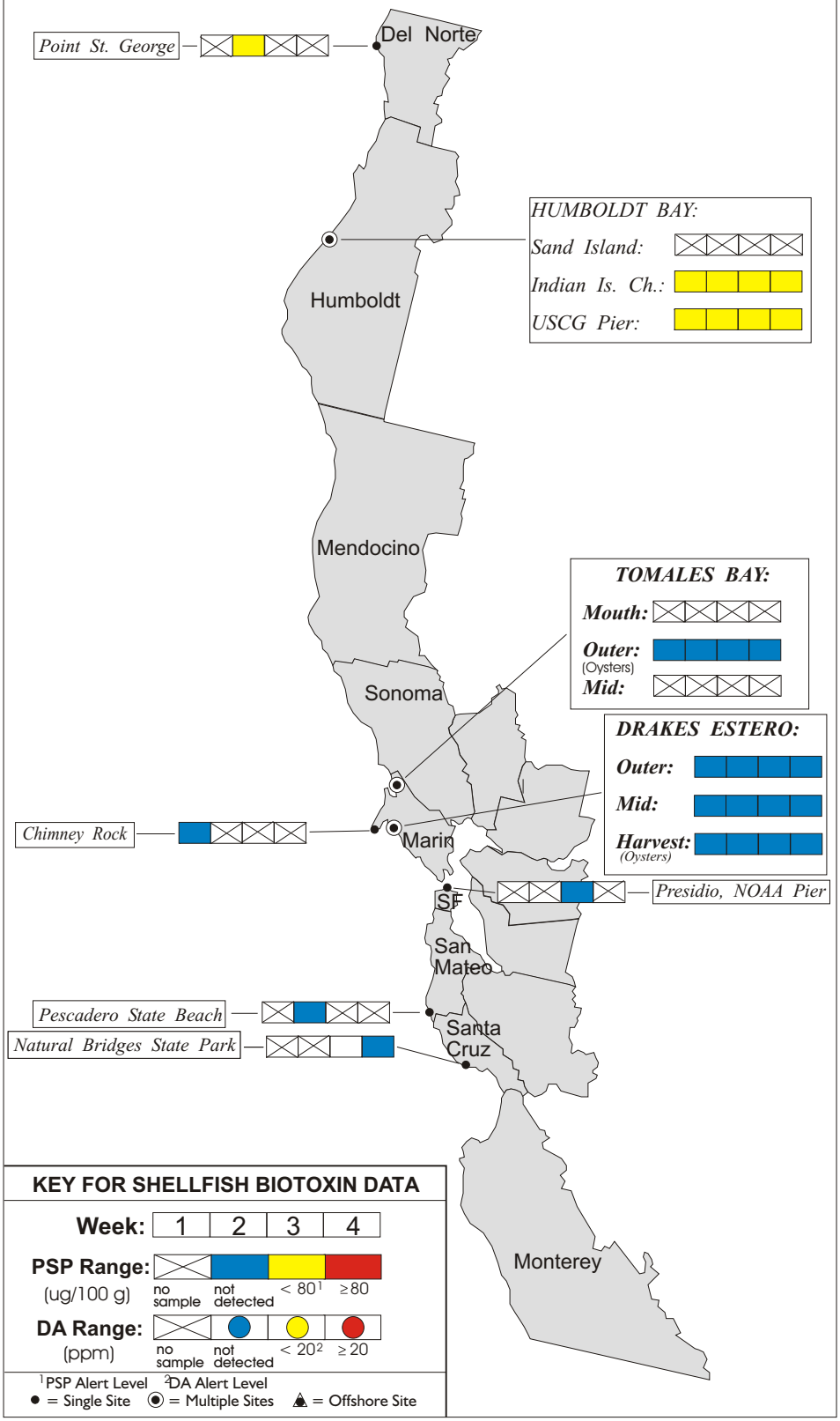
Paralytic Shellfish Poisoning (PSP): PSP toxins were not detected in any shellfish samples from southern California sites during December.

For Information on our Volunteer Field Sampling Program Please Call:

(510) 540-3423

Distribution of Shellfish Biotoxins

Northern California



Northern California Summary:

Paralytic Shellfish Poisoning (PSP):

PSP toxin levels persisted at low levels at sites in Humboldt and Del Norte counties during December. Levels of toxin just above the detection limit were detected at two stations inside Humboldt Bay throughout the month. The maximum concentration observed in December was 50 ug in mussels from Point St. George.

The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.

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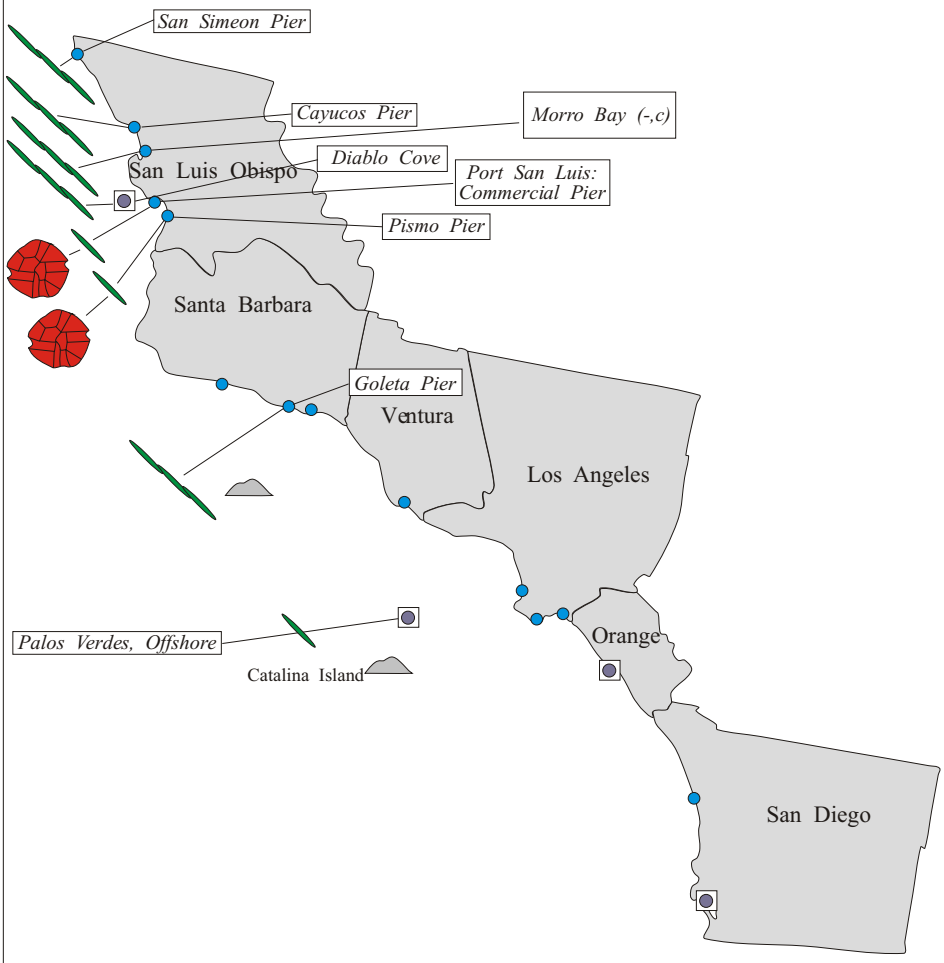
ENVIRONMENTAL MANAGEMENT BRANCH
Phytoplankton Monitoring Program

Phytoplankton Monthly Report

December 2001

Technical Report No. 01-33

Distribution of Toxin-Producing Phytoplankton
Southern California



Relative Abundance of Known Toxin Producers

Alexandrium Species

- Rare (less than 1%)
- Present (between 1% and 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

Pseudo-nitzschia Species

- Present (less than 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Southern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* increased significantly in relative abundance along the San Luis Obispo coast in December compared to November's observations. This dinoflagellate was common at Port San Luis and southward at Pismo Pier, although cell numbers were low.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). *Pseudo-nitzschia* numbers increased along the San Luis Obispo coast north of Port San Luis and at one site in Santa Barbara by the end of December.

The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.

For More Information Please Call:
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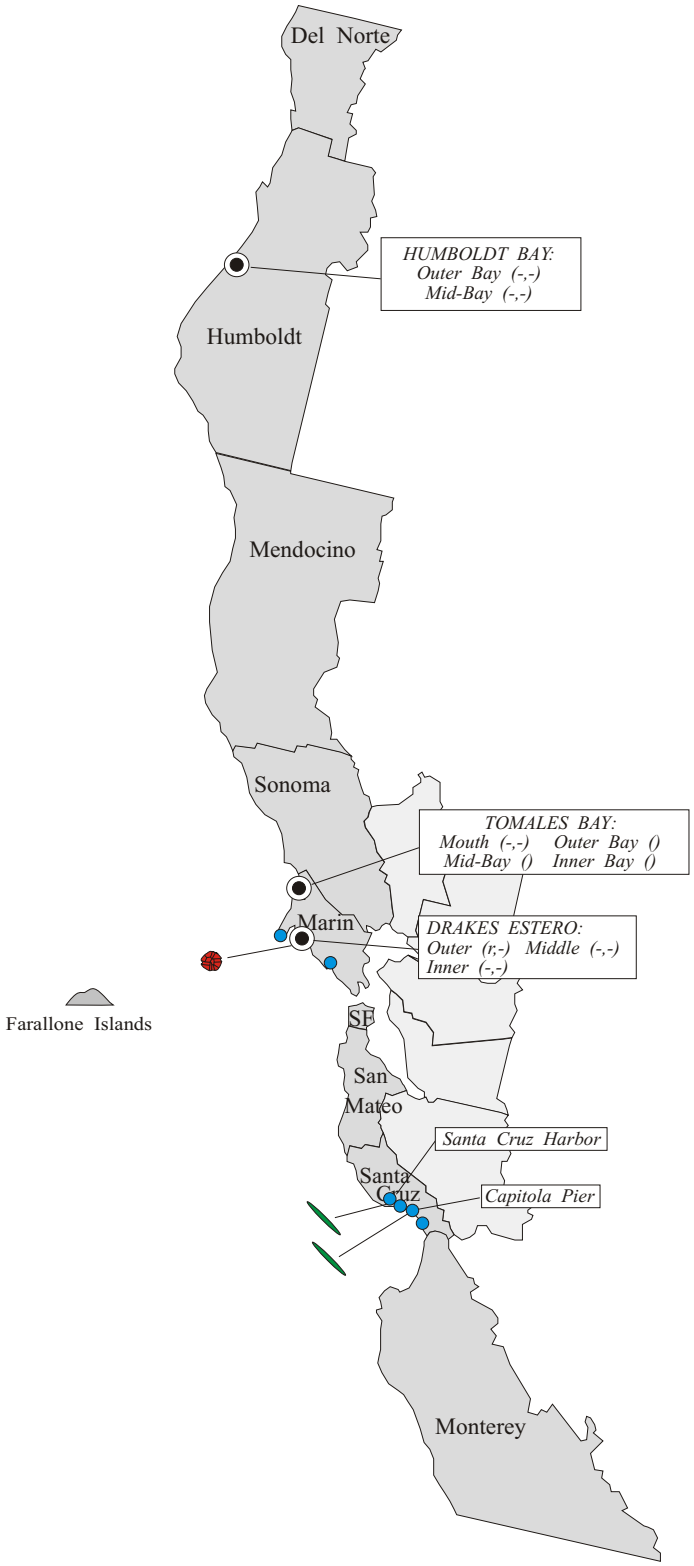
Distribution of Toxin-Producing Phytoplankton Northern California



Northern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* decreased in relative abundance and distribution in December compared to November's observations. This dinoflagellate was only observed in outer Drakes Estero (Marin County) along the northern California coast.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). *Pseudo-nitzschia* was only observed at two sites, both of which were inside Monterey Bay along the Santa Cruz County coastline.

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